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SCHOOL LUNCHES



GROWING CHILDREN have special needs in the way of food. Even when they eat all of their meals at home, it is no easy matter to see that they are properly fed, and when they eat part of their meals at school the difficulty is far greater. This is not because healthfulness and cleanliness are more important in this meal than in any other, but because they are harder to secure. It is not easy to keep food clean and attractive when it must be packed and carried in a lunch basket. Nor is it easy to prepare meals in schools which are not specially fitted for the purpose.

These special problems presented to parents and teachers by the midday meal of school children are considered in this bulletin.

Contribution from the States Relations Service

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SCHOOL LUNCHES.¹

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LUNCH for school children presents two problems—first, supplying the proper kind and amount of food, and second, preparing and serving it.

The first of these must be considered in connection with the other meals of the day. Breakfast, dinner, and luncheon or supper must together supply a large number of different substances, each of which has a special use in the growing and active body of the child. Some of these substances are best supplied by milk, some by cereals, and some by fresh vegetables and fruits and other food materials. The daily diet as a whole must therefore include a variety of food materials, but no one meal must necessarily include them all.

In the case of the well-nourished and carefully fed child it is more important that the school lunch should contain no unclean nor otherwise unwholesome foods than that it should be perfectly balanced, for what the midday meal lacks the other two can supply. In the case of the undernourished child, on the other hand, it is often very desirable to make up at the school lunch for what is lacking in the meals served at home.

In some cases the children live near enough to the schoolhouse to go home at noon. Sometimes the lunch must be packed and carried long distances, and in this case unusual care is needed to make it attractive and to keep it clean and wholesome.

At other times it must be prepared in the schoolroom or other place where there are few conveniences for the purpose; under these circumstances, the choice of dishes is limited, and special care must be taken to provide variety. In still other instances, children are given money with which to buy lunches, and, as a result, lunch counters or lunch rooms have been established in many school buildings.

¹ Prepared under the direction of C. F. Langworthy, Chief, Office of Home Economics.

FOODS THAT CHILDREN MUST HAVE.

In order that children may be strong and well their food must meet three kinds of body needs: First, it must provide the materials necessary for building and repairing all the different parts of the body; second, it must furnish energy or fuel for the work of the muscles; and third, it must serve to regulate the intricate chemical changes on which health and growth depend. The principal building materials are protein, which forms the basis of all the tissues, and mineral matters, such as iron, lime, and phosphorus, which are found in different parts of the body. Protein supplies energy as well as building material, but the greater part of the energy of the ordinary diet comes from starch, sugar, and fat. Among the substances that regulate the chemical changes by which the body grows and functions are some of the mineral matters and the so-called *vitamines*. Although *vitamines* have been only recently discovered and are not yet thoroughly understood, it is believed that three of them, known as *vitamines A, B, and C*, are necessary to health and growth, and that a lack of them may lead to underdevelopment or to such diseases as rickets and scurvy.

The diet of grown persons is usually made up of vegetables and fruits in variety, efficient protein foods in variety (meats and other flesh foods, eggs, milk, and cheese), cereals, fats, and sweets. Very young children usually have milk as the only efficient protein food, eggs are added next, and finally meat and fish, but as stated later, most authorities believe that during the growing period of the normal child, no other efficient protein foods should wholly replace milk.

Milk is regarded as a necessity in the diet of every normal child, because it supplies a very good form of the tissue-building protein, because it is rich in lime, and because it supplies the important *vitamine A*, which is especially needed by the growing body. Estimates of the quantity required differ, but a good rule for most families is to buy a quart of milk a day for each child, making allowance, if economy is necessary, for any served at school.

When a child has a liberal supply of milk, he gets so much protein that such other protein-rich foods as eggs, meat, and cheese are needed in very small quantities, if at all. An egg each day or an equivalent amount, about 2 ounces, of meat, fish, poultry, cottage cheese, peanut butter, or some other protein food is plenty for a child under 12 years of age.

An advantage in using a little egg or meat to supplement the milk is that these materials supply iron, in which the milk is conspicuously lacking. Egg yolks are particularly rich in iron and there are various easy ways of introducing them into the diet. Soft custards

made from milk and egg yolks, sweetened and flavored, can be served either as desserts or in place of cream on fruits or other desserts. The use of egg yolks in thickening soups and milk gravies is also recommended. Hard-cooked egg yolks which, unlike hard-cooked whites, are not considered difficult to digest, make good filling for sandwiches.

Vegetables and fruits furnish a little protein and some yield fair amounts of energy, but they are particularly valuable as sources of the necessary mineral matters and vitamins. Many of them also tend to prevent constipation. Spinach and the other green-leaf vegetables such as lettuce, dandelion greens, beet and turnip tops, are particularly recommended as a source of iron. Iron is also abundant in raisins and figs. Next to milk and milk products, the green-leaf vegetables are considered the best general source of the growth-promoting vitamin A. Almost all the fruits and vegetables supply vitamin B. The scurvy-preventing vitamin C is also found in a considerable number, among those most frequently mentioned being potatoes, carrots, tomatoes, oranges, and lemons. This vitamin seems sometimes to lose its disease-preventing power with age and heating. Very fresh, raw milk, for example, is the only kind that can be relied on to furnish it; when pasteurized milk is used or even raw milk that has been drawn for some time, the diet should include some other source of vitamin C. In potatoes and carrots its power is likely to be lessened by cooking and these vegetables should not be cooked more than necessary to make them taste good. In some acid fruits and vegetables, such as oranges and tomatoes, on the other hand, it seems to survive considerable cooking, and canned tomatoes are considered excellent means of preventing scurvy.

A good way to prepare the green-leaf vegetables is to chop them fine when raw, add a very small quantity of water, and cook them either in a double boiler or directly over the heat. When so prepared, they cook tender very quickly; therefore this method tends to preserve the vitamins. The cooked greens may then be seasoned and served in the usual way, or they may be added to milk soups or to meat stews just before they are served. Finely-chopped lettuce can be mixed with butter or other table fats and used as sandwich filling (see p. 22).

Cereals play a very important part in the food of children. Whether served as bread, as breakfast food, with meat, or as dessert, they can be depended on for a large part of the fuel that every active child needs. Milk and other protein foods, vegetables and fruits, and butter may supply practically all the building and regulating materials needed, but unless they are used in unduly large pro-

portions they do not furnish enough fuel, and cereals are excellent for supplementing them and rounding out the diet in this respect. Highly refined cereals such as white flour, modern kiln-dried cornmeal, and polished rice do not add much mineral matter or vitamins to the diet, but preparations that include most of the bran and germ of the grain supply iron and vitamins A and B. When milk, eggs, vegetables, or fruits are scarce, it is a good plan to use some whole wheat instead of white bread and cracked wheat, oatmeal, and brown rice rather than kinds made from only the starchy parts of the grain. Sandwiches made from whole-wheat bread, lettuce, and egg yolks seasoned with lemon juice and salt are palatable and rich in iron and vitamins.

To be popular with children, cereals must be well prepared. Bread must be light, well baked, and of good flavor, and must have a rich brown crust. Cereal mushes must never be lumpy or salted too much or too little.

Among the fats butter is generally considered the best for children because, like milk, it is rich in the growth-promoting vitamin A. It is no easier to make an exact estimate of the quantity of butter than of milk needed in a child's diet. Speaking roughly, however, an ounce, or 2 cubic inches, or 2 level tablespoons of butter is probably enough for a day when at least $1\frac{1}{2}$ pints of whole milk are used.

Sugar also has a useful place in children's diet as a fuel food and as a flavoring material. For a child 8 to 10 years old an allowance of 2 ounces of sugar a day to be used in cooking or eaten on cereals, fruits, and in other ways is not too much. The point to remember about sugar and sweets in a child's diet is that they should be served chiefly at the end of the meal. If eaten between meals or at the beginning of a meal, they take away the appetite for more important foods.

KEEPING DOWN THE COST OF THE DIET.

Unfortunately most of the foods that children need for the development of strong, healthy bodies are comparatively expensive, even when produced at home. Most families can not afford to use unlimited amounts of milk, eggs, butter, fruits, and vegetables, and so using cereals and sugar to supply fuel is as much a matter of economy as of convenience. One way of showing how different foods compare in cost as sources of body fuel is to measure how much a given number of calories of energy cost when obtained from each. For instance 100 calories of energy from milk at 15 cents a quart cost $2\frac{1}{2}$ cents. One hundred calories from eggs at 63 cents a dozen cost 7 cents; from oranges at 60 cents a dozen, at least 6 cents;

and from tomatoes at 10 cents a pound, 10 cents. On the other hand, wheat flour at 8 cents a pound supplies fuel at the rate of one-half cent per 100 calories, while 100 calories from bread, whether bought or made at home, seldom cost more than 1 cent. There are, of course, some comparatively expensive cereal foods, such as the ready-to-eat breakfast cereals, which usually cost between 48 and 64 cents a pound, or 3 to 4 cents per 100 calories of energy. There is always the choice, however, between them and oatmeal, corn meal, and the various simple wheat preparations, in which the cost of 100 calories is seldom more than 1 cent, including the cost of the fuel necessary for cooking them, which need not be great.

Keeping down the cost of the diet by getting a large part of the fuel from cheap sources, such as the low-priced cereals and sugar at the ordinary prices, is entirely permissible if proper quantities of the other necessary foods are supplied first. In the light of present knowledge of the requirements of the human body in childhood, one of the worst diets that could be devised would be made up chiefly of bread and sweets. There is likely to be no danger, however, if each child has each day at least a pint and a half, and preferably a quart, of milk, a potato, or an orange, a green vegetable, and an ounce of butter.

THE IMPORTANCE OF GOOD BREAD.

American children, of course, eat bread at practically every meal, but oftentimes more at lunch than at supper or dinner. Sandwiches, for instance, are often the most substantial part of the school lunch. They can not be made appetizing and wholesome without good bread, and probably fewer sandwiches would be discarded from children's lunch boxes if the bread were always of the best quality.

Good bread, according to the standard used in judging contests, has a crisp deep crust, an elastic crumb, is light without being dry, has no close, heavy streaks, and has an appetizing flavor and odor difficult to describe but easy to recognize. Further details about bread and directions for making it are given in another bulletin of this series.¹

Hot bread is often thought to cause distress in digestion. When it does so, it is because it lacks some of the characteristics of good bread, not because it is hot. Large or thick biscuits, whether raised with yeast, baking powder, or soda, are likely, if cooked only a short time, to be soggy on the inside, and this, when it happens, is the objection to them rather than the fact that they are served hot.

Children will often eat more bread if different kinds are served. Sometimes so simple a change as baking the bread in a new form, a twist, for example, instead of a loaf, or cutting bread and butter in

¹ Farmers' Bul. 1136, Baking in the Home.

a fancy shape with a cookie cutter, will increase a child's relish for it. So, too, will a change of flavor, obtained by adding a few raisins, dried currants, or nut meats.

CLEANLINESS IN THE HANDLING OF FOOD.

Milk, fresh vegetables and fruits, and other foods considered practically indispensable in the diet of growing children, may, if carelessly handled, be the means of spreading germs of serious diseases. Clean food is best for everybody, but is especially important for children because they are not always able to resist infection so well as adults.

Only clean milk from healthy cows should be given to children.

Vegetables and fruits that are to be served raw must be handled and prepared with great care. Most people will agree that such fruits as apples, oranges, and pears may be considered clean if they are picked from the trees in the orchard far enough from the road to escape dust. If they drop to the ground on clean grass, they may still be eaten without much risk although there will be more chance of their being contaminated with disease-producing bacteria. There may sometimes be danger from poisons used in spraying fruit. All such fruits and all fresh fruits and vegetables, which come from the market should be thoroughly washed in several waters; apples and other large fruits, with unbroken skins may be safely washed with soap. Dried fruits should be particularly well washed. If they are then put into a warm oven to dry, they will absorb the water that clings to them and thus be softened and improved in taste. Dipping in boiling water kills many, if not all, of the bacteria and other organisms that are likely to cling to fresh fruit and does not injure the flavor of many kinds even when they are kept immersed for several seconds. For instance, grapes, apples, pears, peaches, and plums are not injured by this treatment, and unripe strawberries are often improved by it. A wire frying basket for holding the fruit will be found a convenience.

Bread is a food by which dangerous bacteria are sometimes transmitted. Whenever practicable baker's bread should be put into sealed wrappers before it leaves the bakery. Under any circumstances, it is safer to place the bread in a hot oven for a few minutes before serving, and this heating also improves the texture. Since bread can be cut better before it is heated, it may be sliced first, and the pieces left close together so that the heat will reach the crust only.

Cleanliness is as important in those who eat as in those who prepare the food, and whenever lunches are served in the school provision should be made for washing the hands before the meal. No child who shows signs of a cold should prepare or serve food for others, and the dishes he uses should be kept separate from the rest.

THE NOON MEAL AT HOME.

There is no reason why the ordinary family dinner can not be so prepared that it is entirely suitable for school children. The usual first course of meat and vegetables, if simply cooked and not highly seasoned, contains nothing, except the meat, that can not be given even to young children, and for them milk or eggs can be easily substituted for the meat. Moreover, simple cooking is economical of the housekeeper's time and is really more healthful for all the family.

Vegetables cooked in their own juices or in water and seasoned with salt and a little butter or cream are certainly easier to prepare and often more wholesome than if made into elaborate dishes. Children sometimes find these simply cooked vegetables more appetizing if served with a little meat gravy.

Dishes that contain scorched fats are not really healthful for anybody, and least of all for children. If fried foods are served, it is better to have them cooked in deep fat, for if this is properly done the foods absorb little fat and it is less likely to be scorched.

The dessert course of an ordinary dinner is just as good for children as for grown persons, unless it consists of rich pastries or puddings. These are not considered wholesome for children if for no other reason than that they are likely to lead to overeating. Suitable desserts are fruit, fresh or cooked, with cake; custards and custard puddings; gelatin dishes; cereal puddings; simple ice cream; water ices; junket; and blancmange.

If the time for the noon meal is limited, it should be served promptly and in such a way that there are no unnecessary delays. If this is done, an otherwise hurried meal may be changed into one at which there is plenty of time for eating and for attention to good table manners. The meat, for instance, may be sliced before it is brought to the table and the dessert served in cups or individual portions. Also, it is better not to serve hard, tough foods that the children may not have time to chew thoroughly; in fact, sandwiches without crusts and with finely chopped fillings may be best in some cases. It is a mistake, however, to think that children must always have soft or finely divided foods, for their teeth need exercise quite as much as their muscles do, and chewing hard foods helps to develop strong teeth.

If special lunches, different from those prepared for the family in general, are to be given to school children, the following are suggested as bills of fare. They are only typical and many others just as good might be given.

SUGGESTED BILLS OF FARE FOR THE HOME LUNCH FOR CHILDREN.

1. Eggs, boiled, coddled, poached, or scrambled; bread and butter; spinach or other greens; plain cake.
2. Beef stew with vegetables; crisp, thin tea biscuits; honey.
3. Dried bean or pea or peanut butter purée; toast; baked apple; cookies.
4. Vegetable-milk soup; zwieback; rice with maple sugar and butter, milk, or cream.
5. Potato chowder; crackers; jelly sandwiches.
6. Cold meat; creamed potatoes; peas; bread and butter; frozen custard or plain ice cream; plain cake.
7. Lamb chop; baked potatoes; bread and butter; sliced bananas and oranges; cookies.
8. Baked omelet with spinach, kale, or other greens; bread and butter; apple sauce; cake.
9. Milk toast; string beans; stewed dried fruit; cake.
10. Boiled potatoes; codfish gravy; bread and butter; lettuce; custard.

THE BASKET LUNCH.

The basket lunch is harder to plan and also to prepare than the lunch at home. To begin with, there are many foods that can not be included in it, either because they are not good cold or because they can not be conveniently packed or carried, though the special food containers now on the market and paraffin and parchment papers are making it possible to use a somewhat greater variety than formerly. Careful planning, however, is necessary to prevent sameness, and extra care is needed in the preparation of foods that must be packed in small compass and kept for several hours before being eaten.

PACKING THE LUNCH.

Whatever kind of box, pail, or basket is chosen for carrying the lunch, it should be of a kind that can be frequently cleansed and scalded. This is necessary to keep it clean and sweet and to kill bacteria that collect, especially in the seams and crevices of a container, and cause foods to spoil or deteriorate in flavor. In fact, there should be no part of any food container that can not be cleaned. For this reason the simplest boxes and baskets are often better than the more elaborate ones with compartments in which to keep dishes, knives, forks, and spoons.

Metal boxes and pails are perhaps easiest to keep clean, and some of the boxes have the further advantage that they can be folded when empty and strapped with the schoolbooks. Baskets are ventilated and therefore suitable for carrying moist foods that are likely to spoil, though there is no reason why small holes should not be punched in metal boxes or pails to let in the air. Baskets, too, can be washed or scalded. With the increase in automobile travel, there have come on the market well-constructed boxes and baskets with compartments for keeping food hot or cold, and for holding liquids.

These are, of course, suitable only for children who ride back and forth, and especially where several lunches are put up in one household.

Every precaution should be taken to keep the foods in the lunch box clean and in good condition. In dusty seasons they should be wrapped particularly well. In hot weather the use of soft, moist foods in which molds and bacteria are most likely to grow rapidly should be avoided. Although chopped meat moistened with a dressing of some kind makes a good sandwich filling, such foods are less desirable in hot weather than slices of meat, peanut butter, or other foods, less likely to spoil.

Paper napkins or the somewhat heavier paper towels of much the same size, and paraffin and parchment papers, are very useful for packing lunches, and may now be obtained at a low price, particularly if bought in rather large quantities. If no provision is made in the school for serving lunches, an extra napkin, either of paper or cloth, should be put in the basket, to be spread over the school desk when the lunch is eaten. Napkins that are easy to wash and require no ironing can be made of cotton crêpe at a cost of a very few cents each. The crêpe may be bought by the yard, and should be cut into squares and fringed.

In packing the lunch basket sandwiches, cookies, and other foods should be wrapped in neat separate parcels, and the things less likely to crush should be put at the bottom. Paper cups and cartons, jelly tumblers with covers, and bottles and jars with screw tops, such as those in which candy and other foods are sold, can all be used for packing jellies, jams, honey, sliced raw fruits, stewed fruits, custards, cottage cheese, and other half-solid foods.

SUGGESTED BILLS OF FARE FOR THE BASKET LUNCH.

The following bills of fare for basket lunches may help in deciding what is satisfactory for the purpose. Many others equally good will suggest themselves.

Sandwiches with sliced tender meat for filling; baked apple; cookies, or a few lumps of sugar.

Slices of meat loaf or bean loaf; sandwiches; stewed fruit; small frosted cake.

Crisp rolls, hollowed out and filled with chopped meat or fish, moistened and seasoned, or mixed with salad dressing; orange, apple, a mixture of sliced fruits, or berries; cake.

Lettuce or celery sandwiches; cup custard; jelly sandwiches.

Cottage-cheese sandwiches, or a pot of cream cheese with bread-and-butter sandwiches; peanut sandwiches; fruit; cake.

Hard-boiled eggs; baking-powder biscuits; celery or radishes; brown-sugar or maple-sugar sandwiches.

Bottle of milk; thin corn bread and butter; dates; apple.

Raisin or nut bread with butter; cheese; orange; maple sugar.

Baked bean and lettuce sandwiches; apple sauce; sweet chocolate.

LUNCHES PREPARED AT SCHOOL.**ADVANTAGES.**

The basket lunch must usually be prepared at a time when the housekeeper is very busy. In places where there are shops near the school, therefore, children are sometimes given money with which to buy food at noon. They like this, of course, for it is a pleasure to make their own selections and they are glad to be relieved of carrying baskets. If they could choose wisely there would be no objection to this plan, and it might even be made good training in handling money and keeping accounts. In practice, however, it is found that the money is often spent for dirty or otherwise unwhole-



FIG. 1.—Class in cooking preparing cocoa for the school lunch.

some foods. Pickles and pies or, at best, only starchy foods and sweets are likely to make up the bill of fare, and in this way the good effects of careful feeding at home are likely to be overcome.

In many places schools are beginning to serve noon lunches or one or two dishes that can be eaten with food brought from home. Mothers are interesting themselves in this work not only because of its effect upon the health of their children but also because of its relation to education for homemaking. (Fig. 1.) In their own homes they try to serve wholesome food and also to train their children to good habits in eating. They realize, however, that the meal at school is in some ways a better opportunity for training than

those served at home. Unlike the other meals of the child's day, it is eaten during the hours set apart for education. The child's mind is, therefore, in a receptive condition, and every precaution that is taken to adapt the lunch to his physical and mental needs is likely to teach a lesson in food and nutrition, silently, to be sure, but effectively. Mothers recognize, therefore, that the lunch at school may be of assistance to them in one of their special tasks. They are realizing, too, that the preparation and serving of lunches at school may improve the quality of teaching in home economics. Instruction in cookery as an art is, of course, most successfully given where there is a large supply of food materials and of utensils to work with and where the work itself is done with some useful and practical purpose in view. The lunch at school may, therefore, be considered a means of strengthening the courses in cookery and allied subjects, and it has already proved so in many places.

EXPENSE.

Whenever the matter of school lunches is under discussion in a community the cost must be carefully counted. Experience in rural as well as city schools has shown that expenses may be classified under the four heads—equipment, food materials, service or hired help, and supervision.

In a matter of this kind, which from the housekeeper's standpoint is closely related to her own problems of nutrition, the question naturally arises, What part of the expense should the school be expected to meet? It is almost universally agreed that the cost of the food materials should be covered by the sale of food and that it can be if a charge of a few cents is made for each dish. The equipment for the lunch room is usually paid for by the school board or by some organization of parents and patrons formed for the purpose of cooperation with the school. Sometimes pupils themselves raise the necessary money by entertainments given in the school. The cost of upkeep and new utensils, which is not often large, can usually be met from the profits on the sale of food. This leaves only the two items of service and supervision.

SERVICE.

Service, as a rule, is reduced to a minimum, even in large city schools. Trays are provided, and the foods are so placed on a counter or table that the children can wait on themselves. In some cases they are expected also to return the soiled dishes to an attendant. In some schools where cooking is taught the amount of hired help is still further reduced, for the members of the cooking classes prepare and serve the lunches under the direction of the teacher as part of their class work. (Fig. 2.)

SUPERVISION.

The supervision of lunches bears vitally upon the problem of health in the home, for upon it depends the character of the foods selected and the cleanliness of the methods by which they are prepared and served. In this connection the report of a successful experiment in school feeding in a large city says:

The school lunch differs from the street lunch (bought at pushcarts or small shops) not only in quantity and quality of food which children get but also in the ideas about food which they get. Every time a child buys food he gets with it an idea about food. On the streets he gets an inferior product and a harmful idea and a low standard of food quality and care; in the school he gets a wholesome product and, if properly planned, a helpful idea about food and its care.



FIG. 2.—Pupils of a consolidated school serving lunch cafeteria fashion.

Supervision aims to insure this educational value for the school lunch, as well as to guarantee the wholesomeness of the lunch itself. Any means which will give children wholesome and helpful food standards are worth trying, and expense incident to such a plan may properly be charged against education and met by the public treasury.

In large cities a trained supervisor is often employed for all the lunch rooms connected with the school system. In smaller places it is customary for the teacher of domestic science to supervise the school lunch. Where the importance of the task is recognized and due allowance is made for it in planning the program of the teacher, there is no objection to this practice. On the other hand, in schools where this arrangement is adopted there is the best opportunity for making the cooking classes and the lunch room mutually helpful. Even the teacher of general branches is considered better prepared

for her work if she knows something about the hygiene of foods and is prepared to supervise a lunch, as the introduction of courses in home economics into teachers' training schools testifies.

SUITABLE FOODS.

There is no reason why suitable lunches for children should not be supplied, even in places in which only five meals a week are to be served, and which for that reason can not afford elaborate cooking apparatus. Good bread can be bought either from public bakeries or from private housekeepers in practically every locality. The special dishes needed to provide for "tissue building" may well be meat-vegetable stews, cocoa, milk soups or chowders, or other dishes of a similar character which require no oven for their preparation and only the simplest cooking equipment. Though these dishes are especially suitable because they are served hot, sandwiches with fillings of meat or meat substitutes, like those mentioned for the basket lunch, are by no means out of the question, even where cooking facilities are limited. It should be possible also to sell the children milk to drink, though if this is done the greatest watchfulness is required on the part not only of those in charge of the lunch room but also of health officers.

The amount of protein offered for a given sum in the milk dishes mentioned may be increased by the use of skim milk, which, as a matter of fact, has slightly more protein and mineral matter, volume for volume, than whole milk. A quart of soup made with skim milk will contain, of course, more of these nutrients than one made with whole milk and water, half and half. However, skim milk has been handled more than whole milk, and for this reason it is more likely to have become contaminated; therefore extra precautions are necessary when it is used.

Fruits and raw vegetables are permissible wherever there is a good supply of water in which to wash them and care is taken to do this (p. 6). Sweets are, of course, the easiest of all foods to obtain, since they are manufactured on a large scale and very commonly sold.

SAMPLE BILLS OF FARE FOR SCHOOL USE.

Some sample bills of fare follow. Many others equally good could be suggested.

1. Vegetable-milk soup; crackers; rolls; fruit; plain cake.
2. Meat and vegetable stew; bread and butter; sweet chocolate.
3. Boiled custard; lettuce sandwiches; fruit; cookies.
4. Dried codfish chowder; crackers; fruit; maple-sugar or jelly sandwiches.

In the above bills of fare the first item and the fruit can be prepared at school, and the others can be brought in the lunch basket. These bills of fare can, therefore, be used by those who bring part

of their lunch. Where there is an oven and abundant cooking facilities, the bills of fare given on page 8 may be followed at school, as well as at home.

SPECIAL PROBLEMS OF THE RURAL SCHOOL LUNCH.

In the small country school with only one teacher the mid-day meal presents especially difficult problems, but if rightly handled it offers especially favorable opportunities to inculcate habits of cleanliness and to teach sanitation and simple cookery. (Fig. 3.) This will require a teacher of ingenuity and enthusiasm.

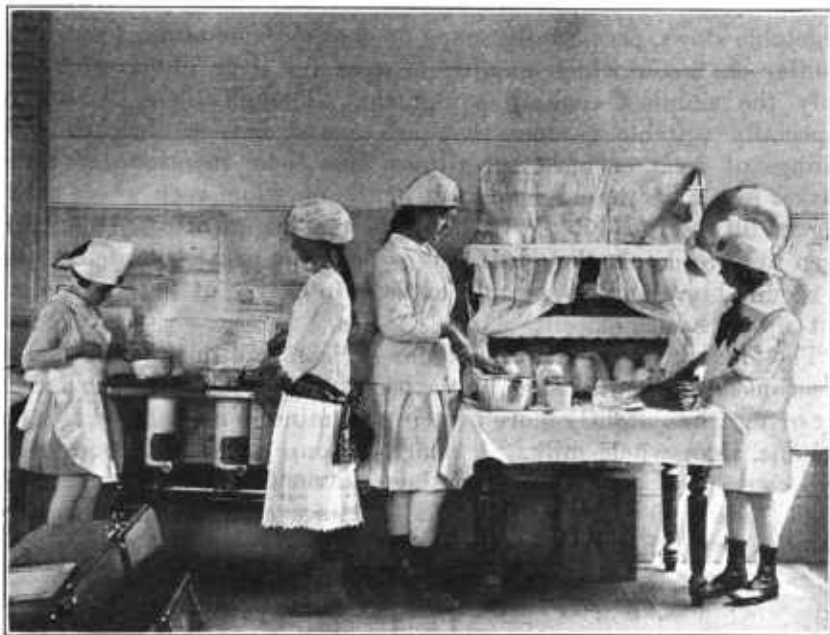


FIG. 3.—Appetizing hot lunches may be prepared even with simple equipment.

The simplest equipment includes a large kettle suitable for use on the stove which heats the schoolhouse, measuring cup and spoons, paring knife, mixing spoon, dish pans, and towels. It will usually be possible for the boys to make a set of shelves for the dishes, using box lumber if no other is available, and for the girls to make curtains or other coverings for the protection of the dishes from dust. The pupils will, as a rule, be found willing to bring plates, cups, bowls, and spoons from home, if this is necessary in order to keep down expenses. A fireless cooker can be made by the pupils as a class exercise.¹ In this a hot dish for lunch can be prepared before

¹ Farmers' Bul. 771, *Homemade Fireless Cookers and Their Uses*.

school. The fireless cooker is convenient for meat stews, meat and bean soups, mushes, and other dishes which require long cooking.

The recipes for the lunch dishes may be given to the older girls in school, discussed in class, and tried at home. The special dish for the day, which in winter is usually hot and in summer more often cold, can be prepared by groups of pupils working in turn.

The food will often have to be served to the children at their seats. (Fig. 4.) This practice is not especially objectionable if the schoolhouse is clean and well ventilated, the desks carefully cleaned before meals, and the building thoroughly screened to keep out flies, which are always dangerous around food since they can convey to it the bacteria that cause diseases. At seasons when there are no flies



FIG. 4.—Older pupils serving hot soup to the younger children at their desks. This is a tidy practice when the desks are covered with clean paper or napkins.

and on days when the weather is favorable, it is a pleasant change to serve the lunch out of doors. Clean hands should always be insisted upon, as well as clean spoons and dishes, and individual drinking cups. Furthermore, children should be taught not to drink out of each other's cups or glasses or to use each other's spoons or forks.

The question of good food and a safe water supply can not be separated. Besides being used for drinking, the water at the schoolhouse is used for washing the hands, and, if any part of the lunch is prepared there, in cooking and in washing dishes. Therefore if the water has in it any of the tiny forms of life that carry disease, the pupils may be infected by using it in any of these ways. In schools in cities that have a good water system there is, of course, less danger than in the country, where dependence must often be

placed on surface wells. When that is the case, too great precautions to provide pure, safe water both at the school and on the farm can not be taken. When there is any question of its purity, all that is used for drinking, cooking, and washing dishes and utensils should be boiled.

It is seldom desirable to prepare more than one dish a day in a small school, and this should, for the sake of variety, differ from day to day. The others can be brought from home. Or ready-to-eat foods (bread, crackers, fruit, or cakes and cookies) can be bought to round out the meal; some one in the neighborhood will usually furnish such foods for sale if there is no shop where they can be obtained. The choice of the dish to be cooked should be determined partly by facilities at the school, partly by what foods are available, and partly by what the teacher has learned from experience is needed to go with the foods brought from home. In any case the aim should be to make the noonday meal appetizing and to include in it the foods that children need.

A FEW RECIPES FOR SCHOOL-LUNCH DISHES.

Most housekeepers have collections of recipes for dishes of all kinds, but probably few have attempted to compile lists of dishes suitable for school lunches. A few such recipes are therefore given here, which may be suggestive.

MILK SOUPS.

The ingredients of milk soups may be grouped under four heads: A liquid; a starchy substance used for thickening; a fatty substance; and flavoring. The liquid may be milk, either whole or skim, or a mixture of milk and one or more of the following in any proportion: Meat stock, water, cream, vegetable juice, including pulp. The starchy substance may be flour, cornstarch, bread crumbs, or grated potatoes. Butter is the best fat for children, though drippings or any other wholesome fat may be used in cooking, provided a small amount of butter fat is regularly served. If cream forms a large proportion of the liquid, no other fat is needed.

The proportions are usually three-fourths of a level tablespoon of flour and an equal amount of butter to each cup of liquid. If starch is substituted for flour, one-half tablespoon to a cup will usually be found sufficient. An interesting school exercise may be arranged by having students make potato starch and use it for thickening these soups or in other ways.

The following recipes for soup and chowder will make about 6 cups or can easily be brought up to this quantity by adding a little milk or water. A cupful is a medium-sized portion, 1½ cupfuls a large portion.

CREAM OF PEA SOUP.

1 can peas, or 1 quart fresh peas.	1 teaspoon salt.
1 quart milk.	$\frac{1}{4}$ teaspoon pepper.
2 tablespoons butter or other fat.	A few drops onion juice.
2 tablespoons flour.	

Heat the peas in their own liquor, or cook them in boiling, salted water until tender. Drain off the liquid and rub the peas through a strainer. Scald the milk and add to it the fat and flour rubbed to a smooth paste. Cook for 1 minute, add the peas, salt, and pepper. Boil for a few minutes and serve at once.

GREEN-LEAF VEGETABLE SOUP.

Soups that should supply a relatively large amount of vitamins may be made according to the following recipe. The materials used are milk undiluted with water, green-leaf vegetables so finely chopped that they need little cooking, and bread crumbs, which absorb the juices of the greens and also serve to thicken the soup. Onion juice or lemon juice is used to improve the flavor and to supply vitamin C.

4 to 8 ounces greens (lettuce, spinach, green cabbage leaves, cress, or young onions with tips).	2 ounces or 2 large slices of bread, preferably without crusts, or 2 ounces ($\frac{1}{2}$ to cup) of bread crumbs.
1 thin slice onion, unless onions are used as the green.	1 teaspoon salt.
1 quart milk.	1 tablespoon butter or fat.

Wash and dry the greens, and put them through the food chopper with the bread and onion, using the finest blade. If the greens are cut or torn into small pieces and mixed with the crumbs, the bread is not so likely to form hard masses. A little of the bread should be put through last to push out the greens. Add the chopped greens and bread to the milk, and if practicable let stand a half hour or more to soften the bread. Heat to the boiling point and cook for about 2 minutes. Add the fat and salt. A tablespoon of lemon juice improves the flavor and somewhat increases the amount of vitamins.

Old spinach may need to be cooked in a little water before the milk is added. Whenever part milk and part water must be used in making the soup, the greens should be cooked in the water first, but only long enough to soften them.

CREAM OF TOMATO SOUP.

1 pint cooked or canned tomatoes.	1 quart milk.
2 tablespoons butter or other fat.	Sprig parsley.
1 tablespoon flour.	$\frac{1}{4}$ teaspoon white pepper.
1 teaspoon sugar.	$\frac{1}{2}$ teaspoon soda.
1 teaspoon salt.	

Cook the tomatoes slowly with the sugar, salt, parsley, and pepper for 10 minutes and rub through a strainer. Scald the milk, thicken with the flour and fat rubbed to a paste; reheat the tomatoes and add the soda; combine with the milk and serve at once.

QUICK TOMATO SOUP.

1 pint cooked or canned tomatoes.	1 teaspoon salt.
1 quart water.	$\frac{1}{2}$ teaspoon pepper.
4 tablespoons butter or other fat.	1 tablespoon chopped onion.
4 tablespoons flour.	

Mix the water, tomatoes, and seasonings. Heat to the boiling point; add fat and flour rubbed to a paste and cook for a few minutes. Strain and serve.

QUICK POTATO SOUP.

1 quart milk.	2 tablespoons butter or other fat.
1 cup grated potato.	A few drops onion juice.
$1\frac{1}{2}$ teaspoons salt.	

Add the potatoes to the milk. Bring to the boiling point, then add the fat, salt, and onion juice. Serve with or without straining.

SOUPS MADE FROM DRIED BEANS, PEAS, OR COWPEAS.

There are a great variety of soups of high nutritive value that can be made from dried navy beans, black beans, lentils, cowpeas, peanuts, or other legumes. The starchy legumes, like beans and peas, should be first soaked in water for several hours, overnight being usually the most convenient time. When they are thoroughly soaked, the water should be poured off and fresh water added. They should then be cooked until tender, with a little onion, celery, or other highly flavored vegetable, and salt, and put through a strainer to remove the skins. The juice and pulp should be either diluted or boiled down to the proper consistency for a soup and should be thickened slightly with a mixture of flour and butter or other fat, as milk soups are.

The protein of peanuts and soy beans is more efficient than that of other legumes, or in other words it contains more of the materials needed to make body protein. Peanut butter, which can be either bought as such or prepared at home or at school, can be quickly made into a good and nutritious soup. This soup also offers a good means of serving lemon or tomato juice, two food materials now believed to supply vitamine C.

PEANUT BUTTER AND TOMATO SOUP.

$1\frac{1}{2}$ cups tomato juice.	1 teaspoon paprika.
$\frac{1}{2}$ cup peanut butter.	$2\frac{1}{2}$ cups boiling water.
1 teaspoon salt.	

Add the tomato juice gradually to the peanut butter, and when smooth add the seasonings and the water. Simmer for 10 minutes, and serve with croutons.

Well-seasoned soup stock and a little lemon juice may be substituted for the water and tomato juice, and the quantity of salt should then be reduced. A few drops of lemon juice may be added just before the soup is served.

CHOWDERS.

Fresh fish or clam chowder and oyster stew are good dishes for school lunches in localities where fresh sea food is abundant. Dried and salt fish or vegetables alone may also be used as the flavoring in

chowders that children will find attractive and wholesome. The ingredients are milk, whole or skim; a fatty substance, which is usually salt pork, though butter may be used; potatoes or crackers, often both; and in addition to these one of the following: Fish, either fresh or salt; green corn, fresh or canned; parsnips, vegetable oysters, kohl-rabi, or celery. A chowder consisting mainly of milk potatoes, and crackers, and flavored with a little salt codfish is perhaps the most economical of these dishes.

SALT-CODFISH CHOWDER.

$\frac{1}{2}$ pound salt codfish, or just enough to flavor.	3 cups cooked potatoes, or diced carrots and potatoes.
$1\frac{1}{2}$ ounces or $1\frac{1}{2}$ cubic inches fat salt pork.	1 quart milk.
1 tablespoon chopped onion.	8 soda crackers (about 2 ounces).

Break the codfish into small pieces, soak it in lukewarm water until it is soft and the salt has been removed. Cut the pork into small pieces and cook it until a delicate brown, adding the onions during the last part of the cooking. To the pork and onions add the potatoes; cover with water, and boil them until tender. Add the milk and the fish and reheat. Add the crackers shortly before the chowder is served.

CORN OR VEGETABLE CHOWDER.

The same general directions can be followed for making corn chowder as for salt-codfish chowder, 1 pint of corn being substituted for the codfish. If fresh corn is used, it should be cooked with the potatoes. Any one, or a combination of two or more of the vegetables mentioned above, may be used in the same way as the fresh corn (that is, cooked with the potatoes) in making a chowder.

POTATO CHOWDER.

$\frac{1}{4}$ pound salt pork, diced.	1 tablespoon flour.
1 tablespoon chopped onion.	1 pint milk.
6 medium-sized potatoes, sliced.	1 pint water.
1 tablespoon butter or other fat.	1 teaspoon salt.

Fry the pork and onion together until both are a delicate brown. Put a layer of sliced potatoes into a kettle, then a layer of onion and pork, and sprinkle with salt. Repeat this until those materials are all used. Pour over them the grease from the pan in which the pork and onion were fried, and add the water. Cover and simmer for 20 minutes, or until the potatoes are tender. Thicken the milk with the flour mixed with the fat and pour it over the potatoes. Stir carefully, so as not to break the potatoes. Serve very hot.

BROWN STEW.

For this dish the cheaper and less tender cuts of beef, such as the rump and round, can be used. Remove the meat from the bone and cut it into small pieces. Dredge with flour and cook in a small amount of fat until it is well browned. Add hot water, about 1 quart to every pound of meat; season with salt, pepper, and onion; and cook

slowly for an hour. The meat should be very tender and the gravy thick. Potatoes, tomatoes, carrots, or other vegetables may be added while the stew is cooking.

GREENS.

Greens should be thoroughly washed in several waters. Lifting the greens out of the water in which they are washed or cooked is safer than pouring the water off, for then the sand and grit that have sunk to the bottom of the pan are not likely to get on the greens again. To preserve the color and also the vitamine, greens should not be cooked longer than necessary to make them tender. A common practice is to add a little soda to the water in which greens are cooked, but this is not desirable unless very large quantities of greens are available and unless a very small proportion of soda is used, not more than one-eighth of a teaspoonful to a quart of water. When greens are scarce and expensive, it is a great mistake to add soda, for the presence of an alkali increases the chances that vitamine A will be destroyed by heat. After the greens have been removed from the water and drained, they should be seasoned with salt and pepper, reheated, and a little butter, cream, oil, or savory fat added to increase the fuel value and improve the flavor. A little lemon juice squeezed on the greens just before they are eaten makes them more appetizing to most people and adds valuable food elements.

RICE COOKED IN MILK.

Rice cooked in milk has a richer flavor than when boiled in water and is particularly nourishing and wholesome for children. It may be served with tomato sauce (p. 21) and grated cheese, as the main dish of the meal, or with maple sirup or crushed fresh fruit as dessert.

One cup of rice will absorb a quart of milk when cooked in a double boiler. First wash the rice thoroughly in several waters so as to remove all loose starch, then drop it slowly into the hot milk, and add 1 teaspoon of salt for each cup of rice. Cook the rice until the grains are soft when pressed between thumb and finger, or for about 30 minutes. Remove the lid of the double boiler during the last part of the cooking, so that the grains will remain separate.

BEAN, PEA, OR COWPEA LOAF.¹

Any of the dried vegetables mentioned in the recipe on page 18 can be made into a loaf. They should be soaked and thoroughly cooked as for the soup, but with less water, and it is well not to add the seasonings until after the vegetables have been put through a sieve. Then chopped celery, green peppers, onions, pimentos, or

¹ Farmers' Bul. 559, Use of Corn, Kafir, and Cowpeas in the Home.

grated cheese can be added, and the mixture formed into a roll or pressed into a dish and browned in the oven. This dish can be served either hot or cold.

SAUCES.

There is a great variety of sauces which can be served with meat or vegetables and also used in making sandwich fillings. In a general way, they are made like milk soups, except that more flour is used. Two tablespoons of flour and two tablespoons of butter or other fat are usually allowed for each cup of liquid. This liquid may be water, broth, tomato juice, milk, cream, the water in which vegetables have been cooked, or a combination of two or more of these.

TOMATO SAUCE.

1½ cups tomato juice.	Sprig parsley.
2 tablespoons flour.	½ teaspoon salt.
2 tablespoons butter or other fat.	½ teaspoon pepper.
1 slice onion.	

Add the seasonings to the tomato juice, and simmer until the liquid has been reduced to about 1 cup. Melt the fat in a saucepan, stir in the flour, and when this is smooth add the strained tomato juice. Cook for a few minutes or until smooth and thick. The tomato juice may be used plain, omitting the first cooking with the seasonings.

This will provide a tablespoonful of sauce for each of 16 persons.

WHITE SAUCE.

2 tablespoons butter.	½ teaspoon salt.
2 tablespoons flour.	½ teaspoon pepper.
1 cup milk.	

Melt the fat, stir in the flour, and cook until smooth, but not brown; add the milk slowly and cook until smooth and creamy. Season.

This makes 12 portions of 1 tablespoonful each.

BOILED AND CODDLED EGGS.

The most common way of preparing eggs is by cooking them for 3 minutes in boiling water. By this process the yolk is left entirely uncooked, and the white is more cooked than many people think desirable.

Many prefer to coddle eggs. This is sometimes done by placing them in hot water, removing them from the stove, and allowing them to stand for 6 to 8 minutes. This is not a very certain method, for much depends upon the temperature of the eggs and the amount of water used. In most cases the following method will be found more satisfactory: Bring to the boiling point one cup of water for each egg to be cooked, put the eggs into the water, remove from the fire, and cover the pan closely. Leave the eggs in the water for from 6 to 8 minutes. "Hard-boiled" eggs can be prepared in the same way by allowing a longer time.

LETTUCE SANDWICHES.

In lettuce sandwiches of the usual kind, made by laying leaves of lettuce between slices of bread spread with butter or salad dressing, the weight of the lettuce is very small compared with that of the bread. Sandwiches so made are very palatable, particularly if pains are taken to make and keep the lettuce crisp. The following recipe is recommended for use only when for one reason or another it is desirable to use a large proportion of lettuce to bread, and also where a large number of sandwiches are desired, for it is hardly practicable to put a small amount of lettuce through the grinder. Lettuce used in this way unfortunately loses its crispness, a quality for which most people value it.

LETTUCE SANDWICHES.

6 ounces or 6 slices bread.	1 teaspoon lemon juice.
6 ounces or 1 medium-sized head lettuce.	1 teaspoon salt.
1 ounce or 2 level tablespoons butter.	$\frac{1}{4}$ teaspoon celery salt.
	Few drops onion juice.

Wash and dry the lettuce. Slice the bread and cut off the crusts. Put the lettuce, crusts, and butter through the food grinder, taking precaution to wrap the butter in the lettuce leaves to prevent it from sticking to the grinder. Season this mixture and spread between the slices of bread.

SALAD DRESSING.

Of numerous salad dressings the following are well suited to school-lunch use. As they are used chiefly for moistening sandwich fillings, it is difficult to give the number of persons they will serve.

OIL AND VINEGAR DRESSING.

$\frac{1}{2}$ teaspoon salt.	6 tablespoons oil (olive, cottonseed, peanut, or other table oil).
2 tablespoons vinegar.	
Few grains cayenne.	

Mix the ingredients and beat them until they are well mixed.

COOKED SALAD DRESSING.

2 egg yolks.	1 teaspoon salt.
$\frac{3}{4}$ cup milk.	$\frac{3}{4}$ tablespoon flour.
$\frac{1}{4}$ cup vinegar.	1 teaspoon mustard.
$2\frac{1}{2}$ tablespoons butter or other fat.	

Mix all the dry ingredients with the egg yolks, beat until light, and add the melted fat, cold milk, and hot vinegar. Cook in double boiler until the mixture coats the spoon. If the mixture curdles, place the boiler at once into a pan containing cold water and beat until smooth. One whole egg may be used in place of two yolks.

MAYONNAISE DRESSING.

1 egg yolk.	1 cup salad oil (olive, cottonseed, peanut, or other table oil).
1 teaspoon salt.	2 tablespoons lemon juice and vinegar.
$\frac{1}{2}$ teaspoon mustard.	
$\frac{1}{8}$ teaspoon cayenne.	
1 tablespoon sugar.	

Put the egg yolk into a cold bowl; add the seasonings and mix until smooth; then add the oil, 1 drop at a time, stirring constantly. As it thickens, thin with vinegar and lemon juice.

SWEETS.

Several recipes for simple sweets follow:

FRUIT AND NUT CONFECTION.

1 pound figs.	1 pound nut meats.
1 pound dried prunes or seedless raisins.	Confectioners' sugar.

Wash, pick over, and stem the fruits, and put them with the nut meats through a meat chopper, and mix thoroughly. Roll out to a thickness of about one-half inch on a board dredged with confectioners' sugar, and cut into small pieces. If this candy is to be kept for some time, the pieces should be wrapped in paraffin paper.

HONEY CAKES.

Simple honey cakes are convenient for use in school lunches, because of their unusual keeping qualities. Honey drop cakes and hard honey cake are especially suitable. Recipes for these are given in another publication of this series.¹

BOILED CUSTARD.

2 cups hot milk.	Speck salt.
3 egg yolks.	Flavoring.
$\frac{1}{4}$ cup sugar.	

Beat the yolks slightly, and add the sugar and salt. Pour the hot milk over this mixture, stirring constantly. Cook in a double boiler, stirring until the mixture thickens and will form a coating on the spoon. Cool and flavor. If the custard curdles, beat with an egg beater.

If the whites of the eggs are to be used, beat them very stiff and add 3 table-spoons of powdered sugar. Place by spoonfuls in water which is hot but not boiling. Cover the dish. Test occasionally by putting a knife into it; when it is done nothing will stick to the knife. Remove from the water with a wire egg beater or split spoon and place on top of the custard.

CUP CAKES WITH ORANGE FROSTING.

$\frac{1}{4}$ cup butter or other fat.	1 cup milk.
2 cups sugar.	3 cups flour.
4 eggs.	4 teaspoons baking powder.

Mix according to the usual method for butter cakes, and bake in gem tins. This recipe should make 24 cakes. The following frosting is recommended as a means of using orange juice and uncooked yolks of eggs:

ORANGE FROSTING.

2 tablespoons orange juice.	Yolk of one egg.
Grated rind of one orange.	Confectioners' sugar.

Let the rind stand in the orange juice for 15 or 20 minutes. Strain and add the yolk of the egg to the juice, mix thoroughly and add confectioners' sugar until of the right consistency to spread.

¹ Farmers' Bul. 653, Honey and Its Uses in the Home.

SUMMARY.

Luncheon for school children is no more important from the standpoint of health than any other meal in the day, but it is more difficult to keep up to the standard of wholesomeness and cleanliness.

No one food offers so good a combination of vitamins, lime, and protein as milk, and, since these three substances are needed by children, milk may be considered essential in their diet. A quart of milk a day, served partly as a beverage and partly in other ways, is not too much for a child. A pint and a half a day should be considered the minimum.

Children also need iron, which is best provided by eggs, meat, green vegetables such as spinach, beets, and other greens, and some fruits including dried fruits like raisins, dates, and figs.

When milk is limited in quantity, butter and green-leaf vegetables are particularly important as sources of the growth-promoting vitamin A.

Oranges, lemons, and tomatoes contain another important vitamin which is present also in potatoes, though in smaller amounts.

Bread and cereals in general, which are among the cheapest food materials, should be served in variety and should be carefully prepared so that children will like them. Some of the cereal foods should always be of a kind known as "whole grain," and when fruits and vegetables are limited, practically all the cereals should be of this kind.

Because contaminated food may be the cause of disease, every care must be taken to keep food clean, not only while it is being prepared but until it is finally eaten. Lunch boxes and dishes should be scalded regularly. Children should be taught always to wash their hands and faces just before eating and never to use each other's drinking cups, spoons, and forks.

When children come home for luncheon with only a short time between school sessions, the meal should be planned so that it can be promptly served to avoid hurried eating.

Basket or box lunches should be planned and packed so that they will keep attractive and wholesome until they are eaten. A collection of small jars with screw tops, parchment cups, paraffin paper, and paper napkins are useful and inexpensive.

If children buy all or part of their lunch, they should be helped to choose wholesome, nutritious food rather than only ice cream, candy, and other goodies of doubtful quality.

Where all or part of the lunch is provided at the school, the proper superintendence of the lunch, including the selection of the foods and the way in which they are prepared, is so important from an educational standpoint that it may well be charged to the teaching account.

The cost of the food materials and the upkeep of the equipment may be paid for by money obtained from the sale of the food. The equipment is often furnished by associations of parents and teachers or paid for with money raised by entertainments.

The preparation and serving of the meals may be made a school exercise. Serving can be reduced to a minimum if pupils wait on themselves.

The school lunch offers a good opportunity to teach food values, food economy, food care, and food hygiene.

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The Manufacture and Use of Peanut Butter. (Department Circular 128.)

The Peanut, a Great American Food. (Yearbook Separate 746.)

